An illustration of such a stent is shown in FIGS. 7A–7B, where a stent **185** as described in FIG. 6A is shown in its expanded condition in FIG. 7A. In FIG. 7B, stent **185** (visible in the cut-away portion) is encased by a polymer member **187**.

The stent of the present invention is particularly suited for use as a structural stent because of the uniform nature of the reticulated structure of the stent in its open, expanded condition. A polymer member carried about the outer periphery of the expanded structural stent is sufficiently supported to prevent the polymer from 'sagging' and potentially obstructing the lumen. The stent of the invention can be tailored for the embodiment, by forming notches or depressions in the structure where the coextensive polymer stent is in contact. In this way, the profile of the polymer/metal stent is not increased.

FIGS. **8A–8D** illustrate introduction, expansion and deployment of the stent of the invention in a body lumen. It will be appreciated that the stent of the invention is suitable for use in a variety of applications, including, but not limited to, prevention of restenosis, reinforcement of reopened, previously obstructed bile ducts and support of narrowing lumens, such as the esophagus, intestine or urethra.

With continuing reference to FIGS. **8A–8D**, and initially with particular reference to FIG. **8A**, a stent **180** is mounted on a balloon portion **182** of a catheter **184**. The stent is secured on the catheter by simply compressing it in place for a snug fit over the balloon. Other means to secure the stent to the balloon include temporary adhesives or a withdrawable sleeve, or through ridges or collars on the balloon to restrain lateral movement of the stent.

The catheter-stent assembly of FIG. **8A** is then advanced through a body lumen of a patient to a treatment site, as shown in FIG. **8B**. Once balloon **182** is positioned at the site it is to be implanted, typically across a lesion such as a plaque deposit **186** within a vessel **188**, the balloon portion of the catheter is inflated by known means, as depicted in FIG. **8C**. The inflation of the balloon causes expansion of the stent from its small-diameter, unexpanded condition of FIG. **8A** to its larger-diameter, expanded condition. The stent radially expands and presses against the lesion, contacting the vessel wall and exerting a radial pressure on the vessel wall.

The balloon is then deflated and the catheter is removed from the vessel. The stent remains in its expanded form within the vessel, as shown in FIG. **8D**, to prevent reclosure or obstruction of the vessel.

From the foregoing, it can be appreciated how various features and objects of the invention are met. The basic unit cell of the invention provides a structure which radially expands with minimal axial shortening. The expansion ratio of the unit cell is readily varied through selection of the dimensions of the unit cell components. Any number of unit cells can be joined radially and axially to form an expandable structure, such as a stent for insertion into a body lumen. It will of course be appreciated that the unit cell will have application in other types of medical device or in other fields which use a radially expandable member.

Although the invention has been described with respect to particular embodiments, it will be apparent to those skilled in the art that various changes and modifications can be made without departing from the invention.

We claim:

1. A unit cell for use in a stent adapted to be expanded to conform to the dimensions of a vessel, comprising;

(i) an elongate connecting bar extending in a direction normal to the direction of stent expansion,

(ii) associated with each end of said connecting bar, a first arm and a second arm, each arm being attached to the connecting bar associated end at an inner arm end for pivotal movement away from one another with stent expansion, said first and second arms having outer arm ends which are moved outwardly, with respect to the connecting bar, with such pivotal movement, and

(iii) an expandable looped member connecting the outer arm ends in each pair of first and second arms, said looped member having an axial extremity which moves axially inwardly, with respect to the associated connecting bar end, with stent expansion,

said arms and expandable looped members being constructed and dimensioned so that the radial outward distance traveled by the arms' outer ends in each pair of first and second arms is approximately equal to the axial inward distance traveled by the associated looped member extremity, as the stent is expanded.

2. The unit cell of claim **1**, wherein said first and second arms in each pair are connected to said looped members through a shoulder member.

3. The unit cell of claim **2**, wherein said shoulder member is a U-shaped, N-shaped or W-shaped shoulder member.

4. The unit cell of claim **1**, wherein said looped members have an undulating configuration.

5. A stent adapted to be expanded to conform to the dimensions of a vessel, comprising a plurality of unit cells, each unit cell composed of

(i) an elongate connecting bar extending in a direction normal to the direction of stent expansion,

(ii) associated with each end of said connecting bar, a first arm and a second arm, each arm being attached to the associated connecting bar end at an inner arm, for pivotal movement away from one another with stent expansion, said first and second arms having outer arm ends which are moved outwardly, with respect to the connecting bar, with such pivotal movement, and

(iii) an expandable looped member connecting the outer arm ends in each pair of first and second arms, said looped member having an axial extremity which moves axially inwardly, with respect to the associated connecting bar end, with stent expansion,

said arms and expandable looped members being constructed and dimensioned so that the axial outward distance traveled by the arms' outer ends in each pair of first and second arms is approximately equal to the axial inward distance traveled by the associated looped member extremity, as the stent is expanded.

6. The stent of claim **5**, wherein said first and second arms in each pair are connected to said looped members through a shoulder member.

7. The stent of claim **6**, wherein said shoulder member is a U-shaped, N-shaped or W-shaped shoulder member.

8. The stent of claim **5**, wherein said axial extremity in each of said looped members has an undulating configuration.

9. The stent of claim **5**, wherein said plurality of unit cells is connected to one or more axially adjacent plurality of unit cells by at least one connecting segment extending between two axially adjacent axial extremities.

10. The stent of claim **9**, wherein each plurality of unit cells includes between 3–500 unit cells.

11. The stent of claim **9**, wherein the stent has an expansion ratio, taken as the diameter of the stent after expansion to the diameter before expansion, of between 1–10.

12. The stent of claim **11**, wherein the expansion ratio is varied by varying the axial length, taken as the distance

between axial extremities in a unit cell, of the unit cells in each plurality of unit cells.

13. The stent of claim **11**, wherein the expansion ratio is varied by varying the number of unit cells in each plurality.

14. The stent of claim **9**, wherein said connecting segment is a U-shaped looped segment.

15. The stent of claim **5**, which further includes an outer stent surface on which a polymer stent is carried, said stent and polymer stent designed for coexpansion in response to an applied force.

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